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Introduction

In spring 1961, President John F. Kennedy approved a mission to land a man on the Moon by the end of the decade. Project Apollo was already underway in its very early stages, with only a circumlunar goal. At the time that Kennedy established his lunar landing goal, the civilian space agency NASA was only two and a half years old and the United States had only 15 minutes of human spaceflight experience.

In November 1961, NASA selected North American Aviation to build the Command and Service Modules (CSM) for Apollo. By the following spring, as the North American contract was definitized, the company’s cost estimate for the CSM had increased substantially over its initial proposal. By May 1962, NASA’s program offices had identified overall costs that were \$425 million more than the budget that the White House actually submitted to Congress for Fiscal Year (FY) 1963, which officially began on July 1. Agency leaders were also already developing plans for NASA’s FY 1964 budget request and trying to balance their stated needs with the lower amounts that NASA was likely to get from Congress and the White House.

By late 1962, several events brought the status of Apollo back to the attention of the White House. First, there was no solid evidence that the Soviet Union was carrying out a lunar program. Indeed, at this time, the Soviets had not yet committed to a lunar landing goal and did not believe that the Americans were serious about Apollo. Second, NASA had selected the lunar orbit rendezvous (LOR) mode for

reaching the Moon. This decision was opposed by the President's Science Advisor, Jerome Wiesner, and his staff, and led to strained relations between NASA and Wiesner. Kennedy had learned of these tensions during a September tour of NASA installations that culminated in his dramatic 12 September speech at Rice University. Third, as a result of the North American contract, the LOR and Saturn rocket decisions, and other developments, NASA revised upwards its cost estimates for reaching the Moon.

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Budgets, Schedules, and Priorities

In October 1962, the Associate Administrator for Manned Space Flight, Brainerd Holmes, developed a "Manned Space Flight Program Launch Schedule for Apollo and Saturn Class Vehicles" and distributed it to the major Center directors and Apollo program directors. It indicated that the first human Apollo launch atop a Saturn C-1 rocket was scheduled for March 1965. There would be six piloted C-1 launches, eight piloted Saturn C-1B launches, and seven piloted Saturn C-5 launches through the middle of 1968. Six unpiloted Saturn C-5 development launches would be required. (The designations for these rockets were later changed slightly, to Saturn I, Saturn IB and Saturn V, respectively.) According to this schedule, the earliest possible piloted lunar landing attempt would be made in the second half of 1967.

Relations between Holmes and NASA Administrator James Webb had been strained since at least the summer of 1962. Holmes had been labeled the "Apollo czar" by the media, and this annoyed Webb. An August 1962 *Time* magazine story on Apollo featured Holmes on its cover ("Reaching for the Moon," *Time* (10 August 1962): 52—57). This article was noticed by media-sensitive members of the White House.

Although Holmes had publicly sought to speed up the Apollo program, in private he was concerned that the existing schedule would slip without more money. He approached Webb about seeking \$400+ million supplemental funding with the belief that this money was required merely to prevent schedule slippage. This money was apparently *not* the Fiscal Year 1963 budget shortfall that NASA's program office had identified earlier in May 1962 (that is, the money that the program managers said that they needed but did not get in the budget). That money was for the entire NASA budget, whereas Holmes was asking for roughly the same amount for Apollo alone.

Webb initially rejected Holmes's approach. Holmes then sought permission to obtain the money for the Apollo program by taking it from other programs, including the space science budget. Webb rejected this approach as well. Holmes then began complaining to the media and Congress, but Webb soon became aware of these complaints. It was after these rejections that Holmes mentioned to Kennedy directly that more money could speed up the Apollo schedule. This undercut Webb's authority.

On 29 October 1962, Webb wrote a letter to President Kennedy concerning the amount of money that would be necessary to move up the first human landing by six months, and by twelve months—in other words, to place Apollo on a “crash” basis. Both sums that Webb provided were considerable, and both would require immediate changes to NASA's budget and an appeal to Congress for additional money, both in the existing budget year and in Fiscal Year 1964.

These events and Webb's letter prompted Kennedy to ask for “an especially critically review” of the total national space effort. The Bureau of the Budget produced a 14 November draft report that listed the projected costs of the various space programs of the U.S. government through 1967. This report concluded that Apollo would cost \$16.4 billion through 1967. It also addressed the question of accelerating the Apollo schedule and how this could be done, and at what cost, presenting four alternatives.

In November 1962, *Time* magazine ran another article on the Apollo schedule detailing Holmes's complaints (“Space in Earthly Trouble,” *Time* (23 November 1962): 15). The article was dated 23 November but appeared on the newsstands on 19 November. Webb's staff managed to obtain an advance copy of the story including a Holmes quote that *Time*'s editors deleted from the printed version: “The major stumbling block of getting to the [M]oon is James E. Webb. He won't fight for our program.” The editors had determined that Holmes had let the earlier August cover story “go to his head.” Furthermore, they felt that he was “out to get Webb.”

One particularly interesting comment during the 21 November meeting is Holmes's apology to Kennedy. Holmes was probably referring to the *Time* magazine article that had appeared earlier in the week.

Following the report from the Bureau of the Budget, and probably prompted by the *Time* magazine article earlier in the week, President Kennedy called a meeting of his

advisors and asked to be briefed on his options concerning the space program. This meeting took place on 21 November 1962—after the recent mid-term congressional elections and over a month after the Cuban Missile Crisis. Present at the meeting were President Kennedy; NASA Administrator James Webb; Science Advisor Dr. Jerome Wiesner; Executive Secretary of the National Aeronautics and Space Council Edward Welsh; Director of the Bureau of the Budget David Bell; NASA Deputy Administrator Dr. Hugh Dryden; NASA Associate Administrator Dr. Robert Seamans; NASA Associate Administrator for Manned Space Flight Dr. Brainerd Holmes; Deputy Director, Bureau of the Budget Elmer Staats; and Deputy Division Chief, Military Division, Bureau of the Budget Willis H. Shapley. Vice President Lyndon Johnson was scheduled to attend but was in Texas during the meeting and therefore was not present. Associate Administrator Seamans gave a 15-minute presentation to Kennedy that was interrupted by a call from the Speaker of the House.

The purpose of the meeting was to discuss the budget and schedule requirements for Apollo at the time, as well as whether a supplemental appropriation to NASA's budget of over \$400 million (that is, additional money in the current fiscal year) was needed. In order for such a supplemental appropriation to take place, President Kennedy had to declare that it was necessary for national security purposes.

According to NASA Associate Administrator Robert Seamans, he originally prepared a 30-minute briefing for Kennedy but was told to cut it to 15 minutes. Apparently, the audio tape recorder was turned on by Kennedy only after this briefing. The recorded portion of the meeting essentially had three parts. During the first part, the attendees discussed the time and schedule for the Gemini and Apollo programs and whether a supplemental appropriation to the NASA budget would speed up the schedule. During the second part, Kennedy and Webb discussed whether Apollo was the top priority of the space program or was part of a broader effort to establish "preeminence" in space. During the third part, after Kennedy had left, Webb discussed the political problems of approaching Congress to seek a supplemental budget appropriation.

In April 1962, Apollo had received a DX or "Brickbat" priority within the U.S. government. This was a national security designation that indicated that the program was first in line for attention and material. Only a few other space and missile programs had a similar designation. Mercury had already had its DX priority revoked by the

time the DX priority was applied to Apollo, in part to preserve the importance of the designation. Ensuring that a program had a high priority but did not adversely affect other programs was always a delicate balancing act, and Apollo program managers had been warned about this when the DX rating was first applied to Apollo. This debate had existed virtually since the beginning of the missile age. For instance, President Eisenhower's advisors had created the first civilian satellite program with a directive that work on the civilian rocket should not affect work on military ballistic missile development.

In summary, Apollo already had the top priority rating that any government program could have—the DX priority. But the program was not on a “crash” basis. What the men were therefore discussing during the White House meeting was increasing the budget, the timeline, and the rhetoric (that is, a clear presidential statement on the importance of Apollo). This would place Apollo on a crash basis but would inevitably affect other programs, particularly at NASA. NASA Administrator James Webb was concerned that doing this could ironically *decrease* the chances for success by damaging projects that were necessary for the success of the lunar landing program.

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Kennedy-Webb Disagreement

Dr. Robert Seamans, the third-ranking official at NASA at the time of this meeting and one of the attendees, has stated that he still remembers the meeting as an unusually freewheeling exchange of views. This is evident from both the recording and the transcript. President Kennedy and NASA Administrator James Webb engaged in a lively discussion. Although at first glance it appears as if they are disagreeing with each other, a closer reading indicates that they shared some of the same views and their discussion never reached the status of what could be considered an argument. Webb was having some difficulty communicating his concerns to Kennedy and Kennedy was trying to make his priorities clear to the NASA Administrator.

Webb had two primary concerns. First, he was worried that key programs both technically and scientifically necessary to achieving the lunar goal, such as the Centaur upper stage and the Surveyor landing craft, would be delayed if all attention was given to the human portions of the lunar effort. Second, he was concerned that a clear presidential statement on the overriding importance of Apollo would undercut his negotiating position with

contractors and the Congress with respect to both management control and other NASA programs.

Webb argued that certain programs that were not formally part of the Apollo program were nevertheless important to its success. One of these was the Centaur, a powerful upper-stage rocket that utilized liquid hydrogen as a propulsion fuel. Liquid hydrogen was a difficult fuel to work with, and NASA had no experience with it. Although Centaur was intended to launch robotic probes to the Moon and outer planets, Webb argued that NASA would also gain vital experience with liquid hydrogen by building Centaur and would be able to apply this experience toward Apollo. He was correct in this claim, as both the second and third stages of the Saturn V rocket—which was still in the early design phase at the time of this meeting—utilized liquid hydrogen. The development of these stages ultimately did benefit from the development of Centaur.

During the meeting, Webb referred to a dispute over Centaur concerning Wernher von Braun, who was then Director of the Marshall Space Flight Center in Huntsville. Marshall was initially responsible for the development of the Centaur, but von Braun showed only limited interest in it and had informed Congress that he did not think that the program was worth continuing. Webb was angered by both von Braun's comments and his perceived undercutting of Headquarters. In what many people viewed as a rebuke of von Braun and an assertion of NASA Headquarters's authority for rocket development decisions, Webb transferred management of Centaur to the Lewis Research Center in Ohio. During the meeting, Webb also mentioned Abe Silverstein, who was then the Director of Lewis and who took over the program.

In addition to the technology programs, Webb felt that certain scientific programs were also necessary for the success of Apollo. For instance, Ranger and Surveyor (and later Lunar Orbiter) were important for characterizing the lunar environment to enable the design of the manned Lunar Module, and for selecting a landing site. Webb did not want to see these programs canceled for being unnecessary for Apollo, even though they were not technically part of the lunar landing program.

Webb resisted having Kennedy clearly state that Apollo was the highest priority space program because he felt that the heads of various contractors, like McDonnell, would immediately use that against him in budget negotiations. They could tell the Congress and the press that they had extra engineers to put on a program and that Webb's

refusal to allow them to do so was obstructing maximum progress on Apollo. Early in the meeting, Webb in particular referred to McDonnell's desire to maintain a large engineering force rather than lay off engineers that it no longer needed. McDonnell had expanded its engineering force to design the Navy's F-4 Phantom interceptor aircraft in the 1950s. If McDonnell dismissed these employees, it would hinder the company's ability to compete on other near-term contracts, such as redesigning the Gemini spacecraft for Air Force missions. Similarly, Webb mentioned Boeing's overcapacity and the company president's desire to dramatically increase the number of people building Saturn rockets.

Although the last part of the meeting, after Kennedy had left the room, is of lesser historical interest, it does demonstrate Webb's detailed knowledge of Washington politics. Webb was widely admired for his political connections and understanding of how Washington worked, and his comments about how committee chairmanships in the houses of Congress would shift as a result of the recent election demonstrates this.

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“...I’m not that interested in space.”

When this transcript was released in August 2001, the press and public focused in particular on one comment by President Kennedy: “Now, this may not change anything about that schedule but at least we ought to be clear, otherwise we shouldn’t be spending this kind of money because *I’m not that interested in space*” (emphasis added).

Only a minute earlier, Kennedy had said, “And the second point is the fact that the Soviet Union has made this a test of the system. So that’s why we’re doing it.”

This is the most dramatic and blunt statement of Kennedy's motivations for sponsoring Apollo. Because of his untimely death and the protectiveness of his advisors, little information has emerged about what Kennedy actually thought about the expensive project that he had initiated, thus requiring that observers divine his motivations largely from his actions and his public speeches. Unfortunately, because of the size and ambition of the Apollo goal, over time many people have assumed that it was primarily motivated by Kennedy's enthusiasm for space exploration and not by political concerns.

Kennedy's comments during this meeting were perfectly

consistent with his decision to establish the lunar goal in the spring of 1961. He made that decision in response to Yuri Gagarin's April 1961 flight around Earth and possibly—although this is less clear—in response to the humiliation he and the country suffered at the Bay of Pigs at the same time. Apollo was a political decision to achieve a political goal, to demonstrate the technological and organizational power of the United States and thereby demonstrate that democratic capitalism was superior to Soviet-style communism as a form of societal organization.

There are other examples during this meeting of Kennedy's view of space as a demonstration of power in the Cold War. During the 21 November meeting, Webb told Kennedy, "And I have some feeling that you might not have been as successful on Cuba if we hadn't flown John Glenn and demonstrated we had a real overall technical capability here." Webb was referring to the recent Cuban Missile Crisis, during which the United States and the Soviet Union had reached the brink of war. The Soviets agreed to withdraw their nuclear-tipped missiles from Cuba in an action that many people perceived as a humiliating defeat and that ultimately led to the downfall of Soviet Premier Nikita Khrushchev.

Kennedy replied, "We agree. That's why we wanna put this program.... That's the dramatic evidence that we're preeminent in space."

Kennedy was not inherently enthusiastic about space exploration. Although he had disagreed about space spending with his opponent, Vice President Richard Nixon, during the presidential campaign, this was because Kennedy and his advisors felt that Nixon was vulnerable on this issue because of his association with the Eisenhower administration record before and after Sputnik. When he had first entered office, Kennedy was immediately presented with a request from NASA for supplemental funding—that is, money in addition to its existing budget. He approved some of this additional funding for the Saturn I rocket in order to redress a perceived American weakness in large rocket launch capability. But Kennedy notably did *not* approve significant additional funding for the Apollo program at that time. In other words, he showed no initial inclination to increase human space exploration much beyond existing plans. Kennedy was interested in space as a symbol of political power, but it was only after the Soviet Union increased the political stakes that Kennedy approved the lunar landing program.

Kennedy was also interested in cooperation with the Soviet Union before Yuri Gagarin's flight. The Eisenhower administration had begun exploring the issue of U.S.-Soviet space cooperation, and Kennedy had continued these studies. Such projects were viewed as potential "confidence-building" efforts that could lead to greater stability during the Cold War. Similarly, after Kennedy announced the lunar landing program, he quietly began looking for ways of backing out of his commitment. He discussed a cooperative mission with Nikita Khrushchev 10 days after announcing the lunar commitment, at the only face-to-face meeting between the two leaders in Vienna, Austria, on 3—4 June 1961. Khrushchev was uninterested in the proposal, and it became dormant for several years.

In September 1963, during a speech before the United Nations, Kennedy again proposed a joint lunar program to the Soviet Union. The proposal was not enthusiastically received by Khrushchev. Kennedy's death only a little more than a month later essentially made the proposal irrelevant. Discussion of a joint Moon mission with the Soviet Union died out in the early months of the Johnson administration. However, Kennedy's actions throughout his presidency were consistent. As President, he viewed space as merely an extension of political competition—and potentially cooperation—between the superpowers.

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The Actual Schedule

In retrospect, it seems unlikely that an increase in Apollo funding or an acceleration of the Apollo schedule would have resulted in any significant changes to the actual outcome. The existing schedule was already unrealistic for achieving the end of the decade goal, as NASA officials soon determined in later 1963.

In June 1963, after a continued dispute with Webb, Holmes resigned. The media reported that Apollo was in disarray. Associate Administrator Seamans felt that the media coverage was overblown, but Webb clearly needed a replacement for Holmes. He soon asked George E. Mueller (pronounced "Miller"), vice president of Space Technology Laboratories, to take over, and Mueller agreed. Mueller immediately ordered a review of the status of the program and determined that Holmes had been correct in saying that the schedule was slipping. The first piloted Apollo launch had already slipped from the second quarter of 1965 to the last quarter, and it soon slipped into 1966. He calculated that at its pace in

September 1963, the first landing might not take place until 1971. But whereas Holmes had determined that more money was needed to accelerate the schedule, Mueller determined that a different flight testing approach was required instead.

Mueller dramatically compressed the Saturn development schedule, eliminating a large number of unpiloted development flights. For instance, instead of six unpiloted Saturn V flights, Mueller reduced the number to three, and NASA ultimately launched only two. In a major change, the piloted Saturn I flights were deleted entirely. This change is commonly referred to as the “all-up” decision, whereby all rocket components were tested simultaneously during a single flight rather than individually over multiple flights.

Mueller and his assistants had to significantly cut the number of Saturn test flights in order to maintain the end-of-the-decade goal, ultimately making the discussions during the November 1962 White House meeting about a late 1966 launch seem highly dubious. The first human Apollo launch slipped from mid-1965 to early 1967. The first landing slipped from late 1967 or early 1968 to late 1968. The Apollo 1 launch pad fire in January 1967 caused the overall schedule to slip by more than a year.

But despite all of these changes, the ultimate pacing item for the Moon landing was not the Saturn or the Apollo spacecraft, but the Lunar Module (LM). A Lunar Module capable of landing on the Moon’s surface was not available until summer 1969, and it is unlikely that any increase in funding, either in late 1962 or at any other time, would have changed this fact. The Lunar Module took as long as it did to build not because of manpower shortages, but because its designers needed to overcome certain basic technical hurdles—and money was not capable of changing this fact.

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Outcome of the Meeting

During Kennedy and Webb’s lively discussion of program priorities, Kennedy told Webb several times to write him a letter summarizing his argument. Kennedy stated during the meeting that he did not think that he and Webb were necessarily in disagreement on the subject, but he wanted Webb to put his views in writing to clarify his arguments. Webb wrote this letter and sent it to Kennedy on 30 November 1962. In this letter, jointly prepared by Webb, Deputy Administrator Hugh Dryden, and Seamans, Webb

restated his position:

The objective of our national space program is to become preeminent in all important aspects of this endeavor and to conduct the program in such a manner that our emerging scientific, technological, and operational competence in space is clearly evident....

Consequently, the manned lunar program provides currently a national focus for the development of national capability in space, and, in addition, will provide a clear demonstration to the world of our accomplishment in space. The program is the largest single effort within NASA, constituting three-fourths of our budget, and is being executed with extreme urgency. All major activities of NASA, both in Headquarters and in the field, are involved in this effort, either partially or full time.

Ultimately, Kennedy agreed with Webb on all of his major points. He did not add more money to the NASA budget or order the acceleration of the schedule. By the summer of 1963, he also publicly agreed that America sought to become preeminent in all important aspects of the space program.

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